

CLAIMS:

What is claimed is:

1 1. A method comprising:
2 measuring one or more performance characteristics associated with each of at least a
3 subset of a plurality of targets in a wireless communication system; and
4 selectively building one or more clusters, each cluster including one or more target(s) and
5 which share wireless communication channel(s), based at least in part on the performance
6 characteristics.

2. A method according to claim 1, wherein the performance characteristics include one or
more of a signal to interference and noise ratio (SINR), a signal to noise ratio (SNR) a received
signal strength indication (RSSI), a bit-error rate (BER) and/or a frame-error rate (FER).

3. A method according to claim 1, wherein each cluster is comprised of up to M targets and
each communication channel accommodates up to N targets, the method of building one or more
cluster(s) further comprising:

4 assigning at least a subset of up to N targets to a first communication channel resource;
5 and
6 selectively assigning subset(s) of a remaining (M-N) targets to share additional
7 communication channel resource(s) within the cluster.

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1 4. A method according to claim 1, wherein measuring the performance characteristics
2 comprises:

3 initializing K sets of weights;
4 estimating the signal to interference and noise ratio (SINR) for each target for each of the
5 K weights; and
6 selecting one of the K weights for each of the targets that maximizes each targets SINR,
7 to produce K clusters of targets based, at least in part, on each target's SINR.

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1 5. A method according to claim 4, further comprising:
2 identifying a target within each of the cluster(s) with a lowest SINR; and
3 generating a new weight for each of the cluster(s) based, at least in part, on the SINR of
the identified target within the cluster(s).

6. A method according to claim 5, wherein the new weight is a least-squares weight
associated with the identified target.

7. A method according to claim 5, further comprising:
estimating the performance characteristics of each of the target(s) within each of the
3 cluster(s) using the generated new weight for each of the cluster(s); and
4 regrouping targets according to the weights that provide the best SINR for each of the
5 targets.

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1 8. A method according to claim 7, further comprising:

iteratively repeating the steps of identifying, generating, estimating and regrouping until
no significant improvement in the estimated performance characteristics of the target(s) is
identified.

9. A method according to claim 8, further comprising:

selectively monitoring at least a subset of target(s) for changing performance
characteristics; and

iteratively repeating the steps of identifying, generating, estimating and regrouping until
no significant improvement in the estimated performance characteristics of the target(s) is
identified.

10. A storage medium comprising content which, when executed by an accessing computing
appliance, implements a method according to claim 1.

11. A communication station comprising:

wireless communication resources; and

a communication agent, coupled with the wireless communication resources, to populate
cluster(s) with one or more target(s) based, at least in part, on one or more estimated
performance characteristics associated with the targets, and to develop a weighting value for at
least a subset of the populated clusters to generate a transmission beam to target(s) within the
cluster(s) based, at least in part, on the developed weighting value.

1 12. A communication station according to claim 11, wherein the wireless communication
2 resources include at least a transmitter subsystem.

1 13. A communication station according to claim 11, the communication agent comprising:
2 a clustering engine, to measure one or more performance characteristics associated for
3 each of at least a subset of a plurality of targets in a wireless communication system, and to
4 selectively build one or more clusters, each cluster including one or more target(s) and sharing a
5 wireless communication channel, based at least in part on the performance characteristics.

1 14. A communication station according to claim 13, wherein the clustering engine initializes
2 K sets of weights, estimates the signal to interference and noise ratio (SINR) for each target for
3 each of the K weights, and selects one of the K weights for each of the targets that maximizes
4 each targets SINR, to produce K clusters of targets based, at least in part, on each targets SINR.

1 15. A communication station according to claim 14, further comprising the clustering engine
2 identifies a target within each of the cluster with a lowest SINR, and dynamically generates a
3 new set of weights based, at least in part, on the SINR of the identified target.

1 16. A communication station according to claim 15, wherein the clustering engine calculates
2 the new weight as a least-squares weight associated with the identified target.

1 17. A communication station according to claim 15, wherein the clustering engine estimates
2 the performance characteristics of each of the target(s) within each of the cluster(s) using the

generated new weight for each of the cluster(s), and regroups targets in clusters according to the weights that provide the best SINR for each of the targets.

18. A communication station according to claim 17, wherein the clustering engine iteratively repeats the process until further re-grouping of targets fails to produce a significant improvement in the estimated performance characteristics of the targets.

19. A transceiver according to claim 18, the communications agent further comprising:
a beamforming engine, responsive to the clustering engine, to modify one or more attributes of a transmission signal to form a beam directed at target(s) within one or more cluster(s) based, at least in part, on the generated weight value(s) associated with each cluster.

20. A communication station according to claim 11, further comprising:
a memory subsystem having stored therein content; and
control logic, coupled with the memory subsystem, to access and execute at least a subset of the stored content to implement the communications agent.

21. In a wireless communication system implementing general packet radio services (GPRS),
a method comprising:
populating cluster(s) with one or more target(s) based, at least in part, on measured performance characteristics of each of the one or more target(s); and

5 developing a weighting value for at least a subset of the populated clusters to generate a
6 transmission beam to target(s) within the cluster(s) based, at least in part, on the cluster spatial
7 signature.

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1 22. A method according to claim 21, further comprising:

2 modifying one or more parameters of a wireless communication link signal to form the
3 transmission beam to target(s) within the clusters based, at least in part, on the developed weight
4 values.

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23. A method according to claim 22, further comprising:

transmitting the formed transmission beam to an associated one or more cluster(s).

24. A method according to claim 21, wherein populating cluster(s) comprises:

measuring one or more performance characteristics associated for each of at least a subset
of a plurality of targets in a wireless communication system; and

selectively building one or more clusters, each cluster including one or more target(s) and
5 sharing a wireless communication channel, based at least in part on the performance
6 characteristics.

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1 25. A method according to claim 24, wherein measuring the performance characteristics
2 comprises:

3 initializing K sets of weights;

estimating the signal to interference and noise ratio (SINR) for each target for each of the
K weights; and

selecting one of the K weights for each of the targets that maximizes each targets SINR,
to produce K clusters of targets based, at least in part, on each targets SINR.

26. A method according to claim 25, further comprising:

identifying a target within each cluster with a lowest SINR; and

generating a new weight for each of the cluster(s) based, at least in part, on the SINR of
the identified target.

27. A method according to claim 26, wherein the new weight is a least-squares weight
associated with the identified target.

28. A method according to claim 26, further comprising:

estimating the performance characteristics of each of the target(s) within each of the
cluster(s) using the generated new weight for each of the cluster(s); and

regrouping targets according to the weights that provide the best SINR for each of the
targets.

29. A method according to claim 28, further comprising:

iteratively repeating the steps of identifying, generating, estimating and regrouping until
no significant improvement in the estimated performance characteristics of the target(s) is
identified.

